

UNITED STATES DEPARTMENT OF AGRICULTURE  
Rural Utilities Service  
Technical Standards Committee "A"

Supplement No. 3, April 2003, to  
RUS Informational Publication 202-1,  
List of Materials Acceptable for Use on  
Systems of RUS Electrification Borrowers

The attached pages dated April 2003, for the "List of Materials Acceptable for Use on Systems of RUS Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of January through March, 2003. They replace pages dated July and October 2002 and January 2003. The following changes should be made in order to keep RUS Informational Publication 202-1 up to date.

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-	h,i-1: BLANK
k(2.1) Cond.:l-1	k(2.1) Cond.:l-1
aj-1:aj(1) Cond.	aj-1:aj(1) Cond.
an-1.1:an-1.2	an-1.1:an-1.2
an-1.3:an-2	an-1.3:an-2
an-3.1:an-3.2	an-3.1:an-3.2
an(1.1) Cond.:an(1.2) Cond.	an(1.1) Cond.:an(1.2) Cond.
an(3) Cond.:an(4) Cond.	an(3) Cond.:an(4) Cond.
av-6:av(1) Cond.	av-6:av(1) Cond.
bz-1:bz(1) Cond.	bz-1:bz(1) Cond.
gz-2:rp(1) Cond.	gz-2:rp(1) Cond.
U an-1:U an-2	U an-1:U an-2
U an(1) Cond.:U ax-1	U an(1) Cond.:U ax-1
U gq-1:U gu-1	U gq-1:U gu-1
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U hv(1) Cond.:U hv(2) Cond.	U hv(1) Cond.:U hv(2) Cond.

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a - Insulator, pin type

ANSI Class	55-2	55-3	55-4
Application	5 kV	12.5/7.2 kV and 13.2/7.62 kV systems	12.5/7.2 kV and 13.2/7.62 kV systems (where greater insulation is needed)
Pinhole diameter	1 in.	1 in.	1 in.
NGK-Locke Porcelain Products (Knox) <sup>2</sup> Victor Insulators, Inc.	- 253 8	- 261-S 5	HRAP-175 366-S 6
ANSI Class	56-1	56-3	56-4
Application	24.9/14.4 kV distribution lines	33 - 34.5 kV transmission lines	44 - 46 kV transmission lines
Pinhole diameter	1-3/8 in. Metal thimble (unless noted)	1-3/8 in. Metal thimble	1-3/8 in. Metal thimble
NGK-Locke Porcelain Products (Knox) <sup>2</sup> Victor Insulators, Inc.	HRAP-195 1027-S 27-R <sup>1</sup>	HRAA-15295B 2045-S 245-R	HRAA-395B - 255-R

<sup>1</sup>Does not have a metal thimble.

<sup>2</sup>ANSI class 55-2, 55-3, 55-4, and 56-1 pin insulators manufactured at both the Knoxville and Macomb plants are acceptable.

Conditional List  
a(1)  
July 2002

a - Insulators, pin type

Manufacturer	Conditions
*Porcelain Products 1027-ST, 24.9/14.4 kV, ANSI Class 56-1	To obtain experience.

\*Does not have metal thimble.

g - Crossarms, fiberglass

<u>Manufacturer</u>	<u>Description</u>	<u>Conditions</u>
<u>Geotek (PUP)</u>		
<u>Braced Application</u>		
T2000-96-03X	8' Type-3 Drill Pattern	To obtain experience
T2000-96-04X	8' Type-4 Drill Pattern	
T2000-120-05X	10' Type-5 Drill Pattern	
T3000-96-03X	8' Type-3 Drill Pattern	
T3000-96-04X	8' Type-4 Drill Pattern	
T3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		
<u>Braceless (Centermount) Application</u>		
TB2000-96-03X	8' Type-3 Drill Pattern	To obtain experience
TB2000-96-04X	8' Type-4 Drill Pattern	
TB2000-120-05X	10' Type-5 Drill Pattern	
TB3000-96-03X	8' Type-3 Drill Pattern	
TB3000-96-04X	8' Type-4 Drill Pattern	
TB3000-120-05X	10' Type-5 Drill Pattern	
(X = color code)		
<u>MacLean Power Systems</u>		
<u>Braced Application</u>		
PX08REA003	8' Type-3 Drill Pattern	To obtain experience
PX08REA004	8' Type-4 Drill Pattern	
PX10REA005	10' Type-5 Drill Pattern	
<u>Braceless (Centermount) Application</u>		
PX08ST003	8' Type-3 Drill Pattern	To obtain experience
PX08ST004	8' Type-4 Drill Pattern	
PX10ST005	10' Type-5 Drill Pattern	
<u>Powertrusion International, Inc.</u>		
<u>Braced Application</u>		
Standard Tangent		To obtain experience
PST08001NR03	8' Type-3 Drill Pattern	
PST08001NR04	8' Type-4 Drill Pattern	
PST10001NR05	10' Type-5 Drill Pattern	
Heavy Tangent		
PHT08001NR03	8' Type-3 Drill Pattern	
PHT08001NR04	8' Type-4 Drill Pattern	
PHT10001NR05	10' Type-5 Drill Pattern	
<u>Braceless (Centermount) Application</u>		
Standard Tangent		To obtain experience
PST08001BR03	8' Type-3 Drill Pattern	
PST08001BR04	8' Type-4 Drill Pattern	
PST10001BR05	10' Type-5 Drill Pattern	
Heavy Tangent		
PHT08001BR03	8' Type-3 Drill Pattern	
PHT08001BR04	8' Type-4 Drill Pattern	
PHT10001BR05	10' Type-5 Drill Pattern	

Conditional List  
g(1.1)  
April 2003

g - Crossarms, fiberglass

<u>Manufacturer</u>	<u>Description</u>	<u>Conditions</u>
<u>Shakespeare</u>		
LSC-REA-03-(X)**	8' Type-3 Drill Pattern	To obtain experience
LSC-REA-04-(X)**	8' Type-4 Drill Pattern	
LSC-REA-05-(X)**	10' Type-5 Drill Pattern	

(\*\*X=2-gray color or 5-dark bronze color)

h - Brace, crossarm, steel

Wherever item "h" is shown on a construction drawing, use a brace from page cu.

i - Bolt, carriage

Applicable Specification: ANSI C135.1, "Standard for Galvanized Steel Bolts and Nuts."

Applicable Sizes:                      3/8 inch diameter, 3 through 6 inch length  
   1/2 inch diameter, 3 through 6 inch length

The following manufacturers have shown compliance with the applicable specifications for carriage bolts.

Dixie Electrical Manufacturing Company  
Hubbell (Chance)  
Hughes Brothers  
Joslyn Manufacturing Company  
Kortick Manufacturing Company  
MacLean (Continental)  
The Rockford Bolt & Steel Company

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k - Insulator, polymer distribution deadend

Manufacturer	Conditions
<u>Salisbury</u>	
Distribution deadend	1. To obtain experience.
9501 Series, 15 kV	2. For use as deadends on distribution lines only.
9502 Series, 25 kV	3. Not recommended for use in areas subject to contamination.
9501U-SI (silicone - 15 kV)	
9502U-SI (silicone - 28 kV)	
9503U-SI (silicone - 35 kV)	
9502L-EP (EPDM - 28 kV)	
<u>Sediver</u>	
Distribution deadend	1. Same as (1) above.
ODI-11-70-15 (15 kV)	2. Same as (2) above.
ODI-15-70-28 (25 kV)	3. Same as (3) above.
ODI-17-70-35 (35 kV)	
<u>Victor Insulators, Inc.</u>	
Distribution deadend	1. Same as (1) above.
8015 (15kV)	2. Same as (2) above.
8025 (25kV)	3. Same as (3) above.
8035 (35kV)	
8215 (15kV)	
8225 (25kV)	
8235 (35kV)	
<u>Volt Tek</u>	
Distribution deadend	1. Same as (1) above.
1515-00 (15 kV)	2. Same as (2) above.
2515-00 (25 kV)	3. Same as (3) above.

NOTE: When insulators from this page are used, adjust construction drawing material list quantities as necessary. Recommended maximum working load is 5000 lbs.

I - Clamp, deadend

DISTRIBUTION

<u>Copper 2 through 6</u> <u>CWC 4A through 8A</u>		ACSR (Aluminum Clamps)			
		<u>4/0 &amp; 3/0</u>	<u>2/0</u>	<u>1/0</u>	<u>2&amp;4</u>
-	Alcoa	302	302	302	302
80500-2000	Hubbell (Anderson)	PG-57N	PG46N	PG-46N	PG-46N
-	C & R	CR-20-90	CR-10-90	CR-10-90	CR-10-90
-	Lapp	306120N	306118N	306118N	306118N
-	MacLean (Bethea)	DA-20N	DA-15-N	DA-15-N	DA-15-N

aj - Clamp, Ground Rod

Manufacturer	For 5/8" Copper-Covered Rod	For 3/4" Galv.or Stainless Steel Rod	For 5/8" Galv.or Stainless Steel Rod
AMP	C-LOK Series	81412-1	81412-1
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GRC58	-	-
C & R Products	CRGC-58	-	-
Connector Castings	G5	-	-
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	GR1-161G	GR1-181G	GR1-161G
2 ground wires	GT1-161G	GT1-181G	GT1-161G
Eritech (Carolina Galv./Knight)	CP 58	UCSS	-
Galvan	G5	-	-
Greaves/Mercury	G-580	-	-
Hubbell (Anderson)	GC-5	-	-
Ilsco	GRC-58	-	-
Joslyn	J8392AB	J25985	J25932
Kortick	K4647	-	-
Lew Electric Fittings	GRC-5/8"	-	-
Line Hardware	RC-58CE	-	-
Penn-Union	CEB-2	CEB-3-TN	CEB-2-TN
MacLean (Reliable)	E58	3459	3459
*Thermoweld	Type CR-1	Type CR-1	Type CR-1
	M-2012	M-2017	M-2012
Utility Grounding Service	C7858C2	-	C7858G2
	C7858C4		C7858G4
	C7858C6		C7858G6
Wilcor	HGR5/8	WAU 5834-B	WAU 5834-B

\*Includes disposable molds.

Conditional List

aj(1)

July 2002

aj - Clamp, ground rod

Manufacturer	Conditions
<u>Burndy</u> YGHP (for 5/8" copper-covered rods)	To obtain experience.
<u>DeMark</u> Copperhead (for 5/8" copper-covered, galvanized, and stainless rods)	To obtain experience.
<u>Line Hardware</u> RC-34 (for 5/8" and 3/4") galvanized or stainless steel ground rods	To obtain experience.
<u>Thomas &amp; Betts</u> DGC58-44 (#4 copper ground wire) DGC58-66 (#6 copper ground wire) (for 5/8" copper-covered rods)	To obtain experience.

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

Applicable Specifications: "RUS Specifications for Rural Distribution Transformers," D-10

Listing is by type rather than by catalog number because of the many possible combinations of voltage, kVA and taps and protective equipment.

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
<u>ABB</u>			
Conventional, single bushing	S-B3	S-B3	S-B3
Self-protected, single bushing	CSP-B3	CSP-B3	CSP-B3
Conventional, two bushing	S-A	S-A	S-A
Type S-B3 may also be obtained with internal fuse, with internal fuse and double gap, and with lightning arrester and open link cutout (Type PC).			
<u>Arkansas Electric Cooperative</u>			
Conventional, single bushing	ASE	-	-
<u>Central Moloney</u>			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	DVP	DVP	DVP
The single bushing transformer may also be obtained with bushing mounted cutout and lightning arrester, and with internal fuse and double gap.			
<u>Cooper Power Systems<sup>1</sup></u>			
Conventional, single bushing	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing	REA-Conv	REA-Conv	REA-Conv
Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.			

Note:

1. Available with optional covers insulated for 15 KV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
<u>ERMCO</u> <sup>1</sup>			
Conventional, single bushing	CONV	CONV	CONV
Conventional, two bushing	CONV	CONV	CONV
Self-protected, single bushing	CSP	CSP	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure: Add "R" (Radial) or "LF" (Loop feed) to designation

<u>Howard Industries</u>			
Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P

<u>Kuhlman</u>			
Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H

Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).

Note:

1. Available with optional covers insulated for 15 KV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, distribution, pole type  
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	7.2/12.5 & 7.62/13.2	14.4/24.9	Dual Voltage
<u>Magnetic Electric</u>			
Conventional, single bushing	AOD	AOD	AOD
Conventional, two bushing	AOD	AOD	AOD
Self-protected, single bushing	AOD	AOD	AOD
<u>Sesco</u>			
Conventional, single bushing	RU	-	-
Self-protected, single bushing	ESP	-	-
Conventional, two bushing	CONV	-	-
Type RU may also be purchased with internal fuse and/or lightning arrester.			
<u>United (Ky. AEC)</u>			
Conventional, single bushing	SC	SC	DSC
Conventional, two bushing	SC	SC	DSC
Self-protected, single bushing	SCP	SCP	DSCP
SC and DSC may be purchased with external fuse and arrester (SP and DSP)			
<u>VanTran</u>			
Conventional, single bushing	CR	-	-
Self-protected, single bushing	CSP-R	-	-
Conventional, two bushing	CD	-	-

an - Transformers, Power  
Single-Phase, Step-Down for Distribution Substation Use

Manufacturer	Primary Voltage - kV	Nominal OA Capacity (kVA)	
		167 - 833	1250 - 10,000
<u>ABB</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
<u>Central Moloney</u>	34.4	X	
<u>Cooper Power Systems</u>	34.4	X	X
	43.8	X	X
<u>Kuhlman</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
<u>Pennsylvania Transformer Technology, Inc.</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
<u>Waukesha Electric Systems</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and, 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Power  
Three-Phase, Step-Down for Distribution Substation Use

Manufacturer	Primary Voltage - kV	Nominal OA Capacity	
		750 to 3750 kVA	5 to 30 MVA
<u>ABB</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A, UTT-B and UVW load tap changers.

<u>Cooper Power Systems</u>	34.4	X	X
	43.8	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B and 550C load tap changers.

<u>Kuhlman</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis Types TLS and TLH load tap changers

Notes:

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and, 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Power  
Three-Phase, Step-Down  
for Distribution Substation Use

Manufacturer	Primary Voltage - kV	Nominal OA Capacity	
		750 to 3750 kVA	5 to 30 MVA
<u>Pennsylvania Transformer Technology, Inc.</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115		X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Cooper Types 550, 550B and 550C load tap changers.

<u>Waukesha Electric Systems</u>	34.4	X	X
	43.8	X	X
	67.0	X	X
	115	X	X
	138		X

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Type UZE; Reinhausen RMT-1; Reinhausen RMV-2; or Waukesha Electric Systems Type UZD load tap changers.

Notes:

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and, 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
<u>ABB</u>	
7.2/12.5, 7.62/13.2 14.4/24.9 kV & Dual Voltage	
Single-phase, single bushing, 25 and 50 kVA pole type distribution transformers with amorphous metal cores.	To obtain experience.
Single-phase, single bushing and two-bushing with internal UMX Under-oil Arrester or with internal "Tranquell" Under-oil Arrester.	To obtain experience.
<u>Cooper Power Systems</u> <sup>1</sup>	
7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, self-protected, with Magnex Interrupter	To obtain experience.
Above or Conventional, single or two bushing; Type REA Conv. or Self-protected, single bushing Type REA-CSP with Type AZU, MOV, heavy-duty under-oil arrester.	To obtain experience.
<u>Ermco</u> <sup>1</sup>	
7.2/12.5 and 7.62/13.2 and 14.4/24.9 kV	
Single-phase, single bushing with internal Tranquell Under-oil Arrester	To obtain experience.

Note:

1. Available with optional covers insulated for 15 KV dielectric strength at additional cost. (Transformer covers with higher electrical insulation, together with other coordinated electrical insulating protective measures, should help to significantly lessen shock and electrocution hazards to raptors, other birds, and small mammals.)

an - Transformers, Distribution, Pole Type

Manufacturer	Conditions
<u>GE-Prolec</u> 12.47/7.2, 13.2/7.62, & 14.4/24.9 kV; 5 through 50 kVA Single bushing and two bushing Conventional & self-protected and 12.47/7.2 x 24.9/14.4 dual voltage	To obtain experience.
<u>Howard Industries</u> 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage	
Single-phase, single bushing, and two bushing with internal "AZU" or "Tranquell" under-oil arrester	To obtain experience.
Single-phase, single bushing, and two bushing; 5 - 50 kVA; with or without taps, with amorphous metal cores	To obtain experience.
<u>Kuhlman</u> 7.2/12.5 kV and 7.62/13.2 kV Toroform design 10, 15, & 25 kVA	To obtain experience.
<u>NECO</u> 7.2/12.5 kV and 14.4/24.9 kV Single-phase, two bushing, 10-50 kVA, Conventional	To obtain experience.
<u>VanTran</u> 14.4/24.9 kV and Dual Voltage	
Conventional, single bushing Type CR	To obtain experience.
Conventional, two bushing Type CD	To obtain experience.
Self-protected, single bushing Type CSP-R	To obtain experience.

an - Transformers, Power  
Three-Phase, Step-Down  
for Distribution Substation Use

Conditions for Acceptance: "E" - To obtain experience

"T" - Manufacturer to furnish RUS with satisfactory test results  
(Only performance specifications have been submitted)

Manufacturer	Primary Voltage - kV	Nominal OA Capacity	
		750 to 3750 kVA	5 to 30 MVA
<u>Delta Star</u>	34.4	E	E
	43.8	E	E
	67.0	E	E
	115	-	E
	138	-	T

Transformers 5 MVA and larger also accepted as load tap changing transformers using Seimens-Allis Types TLS and TLH-21 load tap changers.

<u>Pauwels Transformers</u>	34.4	-	E
	67.0	-	E
	115	-	E
<u>Ferranti-Packard</u>	34.4	E	T
	67.0	T	E
	115	-	E

<u>GE-Prolec</u>	115	-	E
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Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric Types LR72, LR65, and LRT-200 load tap changers.

<u>MGM</u>	34.4	E	T
	43.8	E	T
	67.0	T	E

Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB Types UTS-A and UTT-B load tap changers.

<u>Uptegraff</u>	34.4	T	E
	43.8	T	E

<u>Virginia Transformer</u>	67.0	-	E
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Transformers 5 MVA and larger also accepted as load tap changing transformers using ABB type UZE and Reinhausen type RMV-2 tap changers

<u>Voltran SA de CV</u>	67.0	-	E
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Transformers 5 MVA and larger also accepted as load tap changing transformers using Reinhausen type RMV-II load tap changers.

All acceptances are based on RUS Specification S-3: Specifications for Step-Down Distribution Substation Transformers, and 15 kV or 25 kV class secondary voltages.

115 kV and 138 kV transformers may have one step reduced BIL.

Conditional List

an(4)

July 2002

an - Transformers, Step Ratio, Single Phase,  
Autotransformers or Two-Winding Transformers  
for Use in System Voltage Conversion

Condition of Acceptance: To obtain experience.

<u>Manufacturer</u>	<u>Designation</u>	<u>Size</u>
<u>ABB</u>		
2-WND	"Jumbo"	167-500
<u>Central Moloney</u>		
2-WND	AOD	167-500
<u>Cooper Power Systems</u>		
2-WND	"Round-Coil"	167-500
AUTO	MEPS-AUTO	167-1000
<u>Delta Star</u>		
2-WND	LTD	167-500
AUTO	LTD-A	167-1000
<u>General Electric</u>		
2-WND	HS STEP	167-500
AUTO	HS STEP	167-1000
<u>Howard Industries</u>		
2-WND	STEPS	167-500

NOTE: Two-winding transformers are self-protected under external short circuit in accordance with ANSI C57.12.90A. Auto-transformers will withstand 25 times rated current under external short circuit in accordance with ANSI C57.12.90A.

av - Conductor, Aluminum Alloy

Applicable Specification: ASTM Specification B399

Preferred Sizes:

DISTRIBUTION		TRANSMISSION	
6201	ACSR Equiv.	6201	ACSR Equiv.
48,690 cmil - 7 str.*	4	123,300 cmil - 7 str.**	1/0
77,470 cmil - 7 str.*	2	155,400 cmil - 7 str.**	2/0
123,300 cmil - 7 str.	1/0	195,700 cmil - 7 str.**	3/0
155,400 cmil - 7 str.	2/0	246,900 cmil - 7 str.	4/0
195,700 cmil - 7 str.	3/0	312,800 cmil - 19 str.	266,800 cmil
246,900 cmil - 7 str.	4/0	394,500 cmil - 19 str.	336,400 cmil
		559,500 cmil - 19 str.	477,000 cmil
		652,400 cmil - 19 str.	556,500 cmil
		927,200 cmil - 37 str.	795,000 cmil

\*Not recommended for multiphase lines with span lengths exceeding 300 ft.

\*\*Not recommended for suspension type construction.

The following manufacturers have shown compliance with the applicable specifications:

<u>Manufacturer</u>	<u>Type</u>
Alcan	6201
General Cable	6201
Southwire	6201

av - conductor

Manufacturer	Conditions
<u>Alcan Cable</u> Duplex type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
<u>Copperweld Southern</u> Alumoweld-aluminum 6/1 ACSR/AW, 2, 1/0, 2/0, 4/0 4/3 AWAC, 4, 2, 1/0	To obtain experience.
<u>General Cable</u> T-2 type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.
<u>Southwire</u> VR type, with ACSR or AAAC (6201) conductors using preferred conductor sizes.	1. To obtain experience. 2. Conductor handling and installation shall be in accordance with manufacturer's recommendations.

bz - Switch, oil

12.5/7.2 kV

	Type	Description
ABB	CSL**	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.
Cooper Power Systems	NR*	Single-phase, remote elec. control, 200 amp.
	VR*	Three-phase, remote elec. control, 400 amp.
General Electric	FKC-2 FKC-2*	Single and three-phase, manual, 200 amp. Single and three-phase, remote control, 200 amp.
Maysteel Trinetics	CSD-95, CSD-125	Single-phase, manual and remote manual or elec. control, 200 amp. Three-phase, remote manual or elec. control, 200 amp.

\*Control equipment should be selected in accordance with the requirements of individual installations.

\*\*This item is also available in a special design for use in areas where corrosion is a serious problem.

Conditional List  
bz(1)  
April 2003

bz - Switch, oil

Manufacturer	Conditions
<u>Cooper Power Systems</u> Capacitor oil switch Type TSC, 38 kV max. 100 ampere capacitor switch, 300 ampere load switch	To obtain experience.
Oil switch with 125 kV BIL accessory Type NR, 15 kV, single- phase, remote electric control, 200 amp. at 75 to 100 percent power factor	1. To obtain experience. 2. For use on single- phase taps of 24.9/14.4 kV multi- grounded wye systems.

gz - Crossarm Assembly for Wishbone Construction, "Z" Type  
(Double Arm)

Applicable Specification: RUS Specification T-5

Applicable Drawings: RUS Drawings TSZ-2,

3-5/8" x 5-5/8" wood crossarm assembly complete with brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable specifications for this assembly:

Manufacturer	Catalog Nos. or Drawing Nos.
Brooks (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

rp - Wildlife Guards

Bushings and Live Parts Covers

<u>Manufacturer</u>	<u>Conditions</u>
<u>Chris Kaye (Crittter Guard)</u> Part No. 201 - "L" Bracket Part No. 202 - Roller Part No. 203 - Wheel	To obtain experience
<u>Hendrix Wire &amp; Cable</u> Catalog No. BG-9	To obtain experience
<u>Kaddas Enterprises Inc.</u> Catalog No. KE1045A* birdguard Catalog No. KE1066* arrester cap Catalog No. KE1077* transformer bushing cover Catalog No. KE1053* arrester cap Catalog No. KE1064* transformer bushing cover Catalog No. KE 1049* birdguard	To obtain experience

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

\*Specified by manufacturer as being flame-retardant

Anti-Perch Devices

<u>Manufacturer</u>	<u>Conditions</u>
<u>Hendrix Wire &amp; Cable</u> Catalog No. HPP-24	To obtain experience

NOTE: The material composition of these items does not contain a flame-retardant unless specified by the manufacturer.

U an - Transformers, Distribution  
Pad-Mounted, Dead-Front  
(For underground application)

Manufacturer	Single-Phase 5 - 167 kVA	Three-Phase 30 - 2500 kVA
ABB	"Mini-Pak U-5"	Type MTR (75-1500 kVA) "Plazapad-U5" (2000-2500 kVA)
Central Moloney	"REA-LP"	
Cooper	"REA Shrubline"	"REA Terra-Tran"
ERMCO	"Low-Profile"	
General Electric	-	"Compad IV - REA"
Howard	"Hi Pad REA"	"Hi Pad 3 REA"
Kuhlman	"Lo-Pak ELR"	"K-PAK-3 REA"
H. K. Porter (Delta-Star)	"Low Profile U 5-R"	"Porter U5-R3"
Pauwels Tranformers	"Turf-Hugger-R"	"Turf-Hugger-R"
United (KAEC)	"Pad-Mount" 15-100 kVA (1) "Pad-Mount" 25 & 50 kVA (2)	
VanTran	"Mini-Pad U5" (1)	"VanTran III-U5"

NOTES

All acceptances are based on RUS Specification U-5, "Specifications for Pad-Mounted Transformers (Single and Three Phase)."

All single-phase and three-phase transformers above accepted for the following voltages (kV) unless otherwise noted: 12.47/7.2; 13.2/7.6; 24.9/14.4; and 24.9/14.4 x 12.47/7.2 dual voltage

(1) Accepted for 12.47/7.2 kV and 13.2/ 7.62 kV only.

(2) Accepted for 24.9/14.4 kV only.

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

Not all kVA sizes in above kVA ranges are available from all listed manufacturers.

Some of the above single-phase and three-phase transformers are available with internal under oil surge arresters. The availability and type of arresters vary with each manufacturer. The following types of under-oil arresters are acceptable: "UMX", "Tranquell" and "AZU."

U an-2  
April 2003

U an - Transformers, Distribution  
Pad-Mounted, Dead-Front

(For unit residential underground application)  
(Single-phase, 7.2 kV and 7.6 kV)

Manufacturer	5 - 25 kVA Only
ABB	"Micro-Pak U-5"
Central Moloney	"REA-Mini-LP"
Cooper	"Ranch Runner"
ERMCO	"REA-MicroTrim"
Howard	"Spacesaver Pad"

NOTES

All acceptances are based on RUS Specification U-5, "Specifications for Pad-Mounted Transformers (Single and Three Phase)."

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

U an - Transformers, Distribution  
Pad-Mounted, Dead-Front

(For underground application)

Conditions for Acceptance: To Obtain Experience

<u>Manufacturer</u>	<u>Type</u>
<u>ABB</u>	"Mini-Pak U-5" - Single-phase with composite fiberglass enclosure "Mini Three Phase" (MTP) 30 - 225 kVA
<u>Cam Tran</u>	"Cam Tran" - Three-phase, 12.47/7.2 and 13.2/7.6 kV; 30-2500 kVA
<u>Carte</u>	Three-phase, 24.9/14.4 kV, 30 - 2,500 kVA
<u>Cooper Power Systems</u>	Single-phase, self-protected with "Magnex" interrupter Single-phase, self-protected with "AZU" MOV heavy-duty, under-oil arrester
<u>ERMCO</u>	"E-PAD" Three-phase, 12.47/7.2 kV; 30-2,500 kVA "E-PAD" Three-phase, 24.9/14.4 kV; 30-2,500 kVA
<u>General Electric</u>	"Compad -IV-REA" - Three-phase, 75-750 kVA All above with amorphous metal cores
<u>Square D</u>	Class 7230 REA - Three-phase, 75-2500 kVA 12.47/7.2 kV and 13.2/7.62 kV
<u>Van Tran</u>	"Mini-Pad U5" - 5-167 kVA, 24.9/14.4 kV

NOTES

All acceptances are based on RUS Specification U-5, "Specifications for Pad-Mounted Transformers (Single and Three Phase)."

All single-phase and three-phase transformers above conditionally accepted for the following voltages (kV) unless otherwise noted: 12.47/7.2; 13.2/7.6; 24.9/14.4; and 24.9/14.4 x 12.47/7.2 dual voltage

The enclosures for these transformers have been certified as meeting the requirements of ANSI C57.12.28. A copy of the certification is available from the manufacturer.

Not all kVA sizes are available from all listed manufacturers.

U ax - Cutout and Arrester, Combination  
for Underground System Pole Risers

Nominal System Voltage	For 12.5/7.2 kV		For 13.2/ 7.6 kV	For 24.9/ 14.4 kV
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV
Application	1ø Risers	3ø Risers	1ø and 3ø Risers	1ø and 3ø Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps
Manufacturer	Catalog Numbers			
ABB	7.8LBU-II/ 10 LV	15LBU-II/ 10 LV	15LBU-II/ 10 LV	24.9LBU-II/ 18 LV
Cooper	AFS300B Series	AFS300C Series	AFS300C Series	AFS300D Series
General Electric	9F80	9F80	9F80	9F80
Hubbell (Chance)	C7 Series	C7 Series	C7 Series	C7 Series
Southern States	CA Series	CA Series	CA Series	CA Series

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in RUS Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U gq - Boot or sleeve, insulated\*

Manufacturer	Catalog Number
Blackburn	MPC9 MPC15
Electrical Materials	100-B (For pad-mounted transformer spade terminals)

\*Use restricted to 120/208 volt 500 kVA transformers and larger not equipped with threaded studs.

U gu-1  
April 2003

U gu - Pedestal, Power  
(Above-Grade)  
Refer to Construction Drawing UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Inside Dimensions Inches	Height Inches	Catalog No.
<u>API</u>	9X10	25-1/2	API 9 X 10
	10X11	34	API 10 X 11
	10X11	12-1/4	API 10 X FM
	10X14	22-1/2	API 10 X 14
	10X14	26-1/2	API 10 X 14 WB
	13 Dia.	25	API 176
<u>Coil Sales</u> (Charles Industries)	8.25 Dia	31-1/2	CPLP-8
	8.25 Dia	31-1/2	CPLP-8I(Integral Stake)
	10.75 Dia	31-1/2	CPLP-10
	10.75 Dia	31-1/2	CPLP-10I(Integral Stake)
<u>Electrimold</u>	14.5 x 19.5	31.5	EFSO-111630
<u>Fiberglas Fabricators</u>	14 X 9	31	FFSP Series
	15.5 X 15.5	30	FFSP Series
	15.5 X 15.5	36	FFSP Series
	14 X 9	42	FFSP Series
	9 X 9	31	FFSP Series
<u>MacLean (Reliable)</u>	8 x 8	38	UP 8HLP
	8 x 8	46	UP 8HP
	10-1/2 x 10-1/2	26	UP 10HLP
	16-1/2 x 10-1/2	36	UP 1016HLP
	10-1/2 x 10-1/2	42	UP 10HP
<u>Nordic</u>	8 x 8	44	PR-50, PR-55
	9 x 14	30	PR-149 (stake)
			PR-150 (stakeless)
	9 x 14	30	PRMC 150 (low profile)
	9 x 14	24	PRMC-160
	9 x 14	30	PRMC-170 (high profile)
	9 x 14	36	PRMC-190
	9 X 13	30	PSP-91330
	10 X 15	38	PSPF-101538
	15 X 15	30	PSP-151530
<u>PenCell</u>	11X14	37	AG-15

U gu - Pedestal, Power  
(Above-Grade)  
Refer to Construction Drawing UK5

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

Manufacturer	Inside Dimensions Inches	Height Inches	Catalog No.
<u>Shallbetter</u>	7.5 x 10.25	39	SUTP Series
<u>Utility Fiberglass</u>	27 x 16	40	PPFP-2700
<u>Vertex</u>	8 x 14	30	SP 814
<u>Western Power Products/ Cooper Power Systems</u>	9-1/2 x 9-1/2	30	*SPM-9 DF3
	14-1/2 x 9-1/2	30	*SPM-14 DF3
	9-1/2 x 9-1/2	36	SPM-91 DF3
	9-1/2 x 9-1/2	30	SPM-90 DF3
	14-1/2 x 9-1/2	30	SPM-140 DF3
	14-1/2 x 9-1/2	36	SPM-145 DF3
	18-1/2 x 12	30	SPM-182 DF3
	18-1/2 x 12	54	SPM-190 DF3

\*Furnished with stake.

\*\*Pole mounted

U gu-2  
July 2002

U gu - Power Pedestal  
(Below-Grade)  
Refer to Drawing UK6

Applicable Specifications: "RUS Specifications for Secondary Power Pedestals," U-6

<u>Manufacturer</u>	<u>Catalog No.</u>
<u>Armorcast</u>	Polymer concrete frame and cover with fiberglass reinforced polyester skirting 6001 Series. P600XXXXA Rotocast Series, molded polyethylene with penta-head bolt
<u>Associated Plastics</u>	Molded polyethylene with galvanized steel or plastic cover Catalog Nos. 1730-1, 3; 1324-1, 3
<u>Blackburn</u>	Molded polyethylene with galvanized steel cover and ground lug. Catalog No. SDR-2PG
<u>Burndy</u>	Molded polyethylene with galvanized steel cover. Catalog No. URD20G23
<u>Carson</u>	Molded polyethylene with plastic cover Catalog No. 1324-12B and 1730-12B
<u>CDR Systems (Homac)</u>	Fiber reinforced polymer concrete - PA Series with penta-head bolts
<u>Christy Concrete</u>	Polyester reinforced plastic - Series FL8TRCBOX, FL9TRCBOX, FL30TRCBOX, FL36TRCBOX
<u>Dexol</u>	HDPE, DX-101, DX-102 ABS, DX-101HD, DX-102HD
<u>Electrimold</u>	Polymer concrete ring and cover with fiberglass reinforced skirting ECAB series.  Boxes EPBTH,EPBA series
<u>Fiberglas Fabricators</u>	FFHH Series, Fiberglass FFHHPC Series, Fiberglass polymer concrete hybrid
<u>Highline</u>	HL50AE
<u>Hubbell (Fargo)</u>	HDPE, B-100R Series ABS, B-200R Series HL51

U hv - Cable, Underground  
15 kV and 25 kV Cable

(Alternative Insulation Compound)

Applicable Specification:	RUS Specification U-1
Conductor (15 kV):	Copper or Aluminum - #2 AWG through 1000 kcmil
Conductor (25 kV):	Copper or Aluminum - #1 AWG through 1000 kcmil
Insulation:	Tree-retardant Crosslinked Polyethylene (XLP-TR) (I) indicates Pirelli IE.7100 XLP-TR (II) indicates AT Plastic PowerGuard 320TR (III) indicates Union Carbide HFDB-4202 (IV) indicates Nova Borealis LE 4212
Neutral:	Copper Concentric Neutral
Jacket:	High Molecular Weight Polyethylene
Conditions:	To obtain experience

Manufacturer	Insulation(s)	Flat Strap Neutral Available
General Cable	XLP-TR (II, III, IV)	Yes
Hendrix	XLP-TR (III, IV)	No
Nexans Canada	XLP-TR (II, III)	No
Pirelli	XLP-TR (I, IV)	Yes
Southwire	XLP-TR (III, IV)	No

U hv - Cable, Underground

600 Volt Cable

(Alternative Cable Constructions)

Applicable Specification: RUS Specification U-2 (except as indicated below)

NOTE: Manufacturers listed below are conditionally accepted for alternatives A, B, C , and/or D for the products listed on pages U hv-3 and U hv-4.

Alternative A: 8000 series aluminum alloy in accordance with ASTM B800 or B801.

Alternative B: Stranding in accordance with ASTM B786 for aluminum 1350 conductors or ASTM B787 for copper conductors.

Alternative C: Abuse resistant (ruggedized) (single or two layer) insulation in accordance with ICEA S-81-570.

Alternative D: Self-healing

Condition: To obtain experience.

<u>Manufacturer</u>	<u>Alternative</u>
Alcan	(C)
BICC	(A) (C)
Pirelli	(A) (C)
Southwire	(A) (B) (C) (D)